What is claimed is:

1. A signal processing method, comprises the following steps:

A. sampling a data signal to obtain a carrying function;

wherein a data signal is sampled and the total sampling number is m, and each sample obtains a quantization value expressed as $b_i, i = 1 \cdots m$;

wherein said carrying function can be obtained according to the following steps:

choosing plural base functions and a frequency function *f(t)*;

wherein each base function satisfies the following conditions:

a. being an even function or an odd function;

b. being a continuous function;

c. being a periodic function, which period is T;

d. being orthogonal with other base functions;

wherein each base function *g(n, t)* can be expressed as a form of $h(\frac{nT}{k}t)$:

h representing a function form,

k representing the total number of said plural base functions,

n representing the n-th base function,

t representing the time variable;

wherein bandwidth of said frequency function *f(t)* is f_n and period of said frequency function *f(t)* is T;

using said plural base functions and said frequency function to generate said carrying function, which can be expressed as:

$$F(n,t)=\frac{T}{k}\sum_{i=1}^{k}\left[f(t+\frac{T}{k}i)g\left(n,\frac{T}{k}i\right)\right]$$

B: encoding said sampled data signal by said carrying function to obtain a transmission signal, which bandwidth is f_n and can be expressed as: $SM(t)=\sum_{i=1}^{n} b_i F(i,t)$.

2. The signal processing method according to claim 1, wherein a decoding method is to sum up every multiplication of each transmission signal and each base function for sequentially obtaining said data signal, which can be expressed as:

$$b_n = c_n \sum_{j=1}^{k}\left[SM\left(t+\frac{T}{k}j\right)g\left(n,\frac{T}{k}j\right)\right], n=1\cdots k$$

wherein c_n is a constant.

3. The signal processing method according to claim 1, wherein said plural base functions are normalized functions.

4. The signal processing method according to claim 1, wherein said base functions are sine functions.

5. The signal processing method according to claim 1, wherein said base functions are cosine functions.

6. The signal processing method according to claim 1, wherein said base functions are combinations of sine functions and cosine functions.

7. The signal processing method according to claim 1, wherein said base

functions can be calculated in advance and are stored in a memory device.

8. A signal processing method, comprises the following steps:

choosing plural base functions and a frequency function *f(t)*,

wherein each base function satisfies the following conditions:

a. being an even function or an odd function;

b. being a continuous function;

c. being a periodic function, which period is T;

d. being orthogonal with other base functions;

each base function *g(n,t)* can be expressed as a form of $h(\frac{nT}{k}t)$, wherein:

h representing a function form,

k representing the total number of said plural base functions,

n representing the n-th base function,

t representing the time variable;

wherein period of said frequency function *f(t)* is T;

using said plural base functions and said frequency function to generate said carrying function, which can be expressed as:

$$F(n,t)=\frac{T}{k}\sum_{i=1}^{k}\left[f(t+\frac{T}{k}i)g\left(n,\frac{T}{k}i\right)\right]$$

9. The signal processing method according to claim 8, wherein a data signal is encoded by said carrying function to obtain a transmission signal, which can be expressed as:

$SM(t) = \sum_{i=1}^{n} b_i F(i,t)$, wherein $b_i, i = 1 \cdots m$, is obtained by said data signal after sampling and quantization steps.

10. The signal processing method according to claim 9, wherein a decoding method is to sum up every multiplication of each transmission signal and each base function for sequentially obtaining said data signal, which can be expressed as:

$$b_n = c_n \sum_{j=1}^{k} \left[SM\left(t + \frac{T}{k} j\right) g\left(n, \frac{T}{k} j\right) \right], n = 1 \cdots k$$

wherein c_n is a constant.

11. The signal processing method according to claim 8, wherein said plural base functions are normalized functions.

12. The signal processing method according to claim 8, wherein said base functions are sine functions.

13. The signal processing method according to claim 8, wherein said base functions are cosine functions.

14. The signal processing method according to claim 8, wherein said base functions are combinations of sine functions and cosine functions.

15. The signal processing method according to claim 8, wherein said base functions can be calculated in advance and are stored in a memory device.